

REMARKS

I. Status of the Claims

Claims 1-4 were pending in the application prior to this Amendment. Claims 1-4 were rejected by the Examiner.

With this Amendment, dependent claim 3 has been amended and dependent claim 4 has been canceled without prejudice or disclaimer. No new matter has been introduced, and thus, entry and consideration of this Amendment are respectfully requested.

II. Objection to the Specification:

The Examiner has objected to the title as being “not descriptive.”

In response to the Examiner’s objection, Applicants have amended the title of the invention to more clearly describe the invention, as claimed. The title of the invention, as amended, now reads: FOCUS DETECTION BASED ON AN OPENING PUPIL RATIO.

Applicants believe that no further formal issues exist in the specification, and therefore, respectfully request that the objection to the specification be withdrawn.

III. Claim Rejection - 35 U.S.C.§ 101

Claim 3 was rejected under 35 U.S.C.§ 101 because the claimed invention is directed to non-statutory subject matter. More specifically, claim 3 includes a computer program not recorded or embodied on a computer-readable medium, which renders it non-statutory.

In response to the 35 U.S.C.§ 101 rejection, claim 3 has been amended and claim 4 has been canceled without prejudice or disclaimer. Applicants believe that the amendments to claim 3, now presented for consideration herein, bring the claim into compliance with current United States Patent and Trademark Office guidelines on patentable subject matter.

In view of the above, Applicants respectfully request that the rejection to claim 3 under 35 U.S.C.§ 101 now be withdrawn.

IV. Claim Rejections - 35 U.S.C.§ 102

Claims 1 and 2 stand rejected under 35 U.S.C.§ 102(b) as being anticipated by U.S. 5,995,144 to Sasakura (hereafter, “Sasakura”). More specifically, the Examiner contends that the Sasakura reference anticipates each and every limitation of both claims 1 and 2.

Sasakura is an automatic focus system for an image capture device (camera). However, the Examiner does not rely on the actual disclosure of the Sasakura invention, but instead asserts that the background of the invention in Sasakura, including at least FIG. 1-4 and columns 1-3, anticipates the present invention, as claimed. This discussion of the prior art centers on auto-focus methods in film-type cameras, wherein a light incident from lens 1 is passed through a half-mirror 2 and is reflected downward from sub-mirror 3 (e.g., FIG. 1). A secondary imaging lens 6 then breaks the light into two beams which fall incident on two line sensors 7A and 7B (e.g., FIG. 2) composed of a predetermined number of pixel photoelectric conversion elements. These line sensors measure the light intensity along the length of the sensor, and determine if the maximum intensity of both sensors correlates to a predetermined “focus” distribution. If, for example, both intensities fall inside this range, then the lens is near-focused (e.g., FIG. 2). Otherwise, if the intensities fall outside of the predetermined focus distribution, then the lens may be determined to be far-focused.

Applicants contend that nothing in the Sasakura disclosure anticipates each and every limitation of both claims 1 and 2. For example, claim 1 currently recites the following:

1. (Original) A focus detection device comprising:
 - a solid state image sensing device including a first photoelectric conversion element array which photoelectrically converts a first light beam passing through a first area of an exit pupil of a photographing optical system, and a second photoelectric conversion element array which photoelectrically converts a second light beam passing through a second area of the exit pupil which is different from the first area; and
 - a computing device which detects a focus state of the photographing optical system by computing a correlation between a first image signal which is an image signal from the first photoelectric conversion element array and a second image signal which is an image signal from the second photoelectric conversion element array in accordance with a position of a focus detection area in an image sensing frame on the basis of a ratio between a shift amount of a focus detection opening pupil, formed when limitation is imposed by an exit window of

the photographing optical system, with respect to an optical axis, and a width of the focus detection opening pupil.

The background of Sasakura, as relied-upon by the Examiner, is distinguishable from the claimed invention because the correlation discussed in the background of the invention is based on a distribution of voltages generated in two linear arrays of pixel photoelectric conversion elements. The prior art process is not analogous to determining a focus correlation “on the basis of a ratio between a shift amount of a focus detection opening pupil, formed when limitation is imposed by an exit window of the photographing optical system, with respect to an optical axis, and a width of the focus detection opening pupil” as recited in both claims 1 and 2.

More specifically, Sasakura neither recites nor implies any relationship between the shift amount and width of the pupil. Therefore, Sasakura cannot perform the shading correction as recited in at least the claimed invention, even if Applicants were to concede that “it is inherent that the shifted light will be limited by the pupil” as set forth by the Examiner.

In view of the above, Applicants contend claims 1 and 2 are distinguishable from Sasakura, and respectfully request that the rejection under 35 U.S.C. § 102(b) now be withdrawn.

V. Claim Rejections - 35 U.S.C.§ 103

Claims 3 and 4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sasakura in view of U.S. 7,102,675 to Tokunaga (hereafter “Tokunaga”). More specifically, the Examiner asserts that claims 3 and 4 are obvious in view of Sasakura and Tokunaga combined.

Tokunaga is an auto-focus system for an image capture device (camera). The Examiner relies on Tokunaga to provide the teaching of a program for executing focus detection. Tokunaga neither recites nor implies determining a focus correlation “on the basis of a ratio between a shift amount of a focus detection opening pupil, formed when limitation is imposed by an exit window of the photographing optical system, with respect to an optical axis, and a width of the focus detection opening pupil” as claimed. Therefore, Tokunaga does not remedy the deficiencies previously discussed with respect to the Sasakura reference.

In view of the above, Applicants contend that claims 3 and 4 are distinguishable from the Sasakura and Tokunaga references, taken alone or in combination, for at least the reasons set for the above with respect to the Sasakura reference, and therefore, respectfully request that that the 35 U.S.C. § 103(a) rejection now be withdrawn.

CONCLUSION

Based on the foregoing amendments and remarks, Applicants respectfully request reconsideration, withdrawal of the rejections and allowance of this application.

AUTHORIZATION

The Commissioner is hereby authorized to charge any additional fees which may be required for consideration of this Amendment to Deposit Account No. 13-4500, Order No. 1232-5227. A DUPLICATE OF THIS DOCUMENT IS ATTACHED.

In the event that an extension of time is required, or which may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No 13-4500, Order No. 1232-5227. A DUPLICATE OF THIS DOCUMENT IS ATTACHED.

Respectfully submitted,
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